

### ***In the Claims***

The status of claims in the case is as follows:

1        1.    [Currently amended]    A method for filling a polygon  
2        with a minimum number of rectangles, comprising:

3                    bordering said polygon, including:

4                    ~~selecting a starting border width~~

5                    calculating a maximum current polygon border width  
6                    including adjusting a maximum stripe width input  
7                    parameter to a new upper limit which reflects  
8                    characteristics of a current polygon as well as  
9                    any previous border polygons by

10                    calculating the length of each side of said  
11                    current polygon;

12                    deriving a smallest side length parameter  
13                    equal to the larger of (1) a first factor

14 times said minimum stripe width or (2) the  
15 length of the shortest side obtained from  
16 said calculating length;

17 setting said smallest side length parameter  
18 from said deriving to a reduced amount by a  
19 second factor;

20 if said current polygon is an inner border  
21 and said smallest side length parameter is  
22 less than the previous border width, setting  
23 said smallest side length equal to said  
24 previous border width;

25 if said smallest side length parameter is  
26 greater than said maximum stripe width  
27 parameter, setting said smallest side length  
28 parameter equal to said maximum strip width  
29 parameter; and

30 returning said smallest side length parameter  
31 for processing as said maximum current  
32 polygon border width parameter;

33 merging border segments where possible; and then

34 orthogonally filling.

1 2. [Currently amended] A method for filling an original  
2 polygon envelope with a minimum number of stripes,  
3 comprising:

4 creating a border polygon including a plurality of  
5 border segments; including:

6 calculating a maximum current polygon border width  
7 parameter for a current polygon;

8 responsive to said maximum current polygon border  
9 width parameter, calculating a border width  
10 parameter for a current border;

11 creating a border polygon with a width equal to  
12 said border width parameter;

13 responsive to a merge adjacent borders flag being  
14 enabled, creating a new border including merging  
15 said current border with a previous border if

16                   possible;

17                   responsive to said new border from said merging,  
18                   creating a new fill polygon;

19                   creating a least encompassing rectangle for said  
20                   new fill polygon; and

21                   responsive to said least encompassing rectangle  
22                   being contained entirely within said original  
23                   polygon envelope, ending said creating a border  
24                   polygon and passing any uncovered area within said  
25                   new fill polygon to said generating; otherwise,  
26                   returning to said calculating width to process  
27                   said new fill polygon as said current polygon;

28                   merging border segments where possible; and thereafter  
29                   switching to generating orthogonal fill stripes; and

30                   processing uncovered areas.

1           3.   [Previously presented]   The method of claim 2, further  
2           comprising:

3 receiving input parameters, said input parameters  
4 including parameters defining a minimum stripe width, a  
5 maximum stripe width, and a merge adjacent borders  
6 flag.

1 4. [Original] The method of claim 2, said input  
2 parameters further including stripe overlap amount.

1 5. [Original] The method of claim 3, said input  
2 parameters further including wire with ends size delta, and  
3 maximum number of borders.

1 6. [Canceled]

2 7. [Currently amended] The method of ~~claim 6~~ claim 2,  
3 said calculating a maximum current polygon border width  
4 further comprising:

5 adjusting said maximum stripe width input parameter to  
6 a new upper limit which reflects characteristics of  
7 said current polygon as well as any previous border  
8 polygons.

1 8. [Previously presented] The method of claim 7, said

2       adjusting further comprising:

3           calculating the length of each side of said current  
4           polygon;

5           deriving a smallest side length parameter equal to the  
6           larger of (1) a first factor times said minimum stripe  
7           width or (2) the length of the shortest side obtained  
8           from said calculating length;

9           setting said smallest side length parameter from said  
10          deriving to a reduced amount by a second factor;

11          if said current polygon is an inner border and said  
12          smallest side length parameter is less than the  
13          previous border width, setting said smallest side  
14          length equal to said previous border width;

15          if said smallest side length parameter is greater than  
16          said maximum stripe width parameter, setting said  
17          smallest side length parameter equal to said maximum  
18          strip width parameter; and

19          returning said smallest side length parameter for

20 processing as said maximum current polygon border width  
21 parameter.

1 9. [Previously presented] The method of claim 8, said  
2 calculating a border width for a current border further  
3 comprising:

4 responsive to said minimum stripe width parameter and  
5 said maximum current polygon border width parameter,  
6 deriving a border width variable selectively operable  
7 for determining that said current polygon is impossible  
8 to be bordered or that said generating orthogonal fill  
9 stripe be executed.

1 10. [Previously presented] The method of claim 9, said  
2 deriving a border width variable further comprising:

3 initializing said border width variable equal to said  
4 maximum current polygon border width parameter;

5 rounding said border width variable;

6 if said border width variable exceeds said maximum  
7 stripe width parameter, setting said border width

8           variable equal to said maximum stripe width parameter;

9           iteratively shrinking and expanding said current

10          polygon with a shrink value equal to said border width

11          variable;

12          if said shrinking causes said current polygon to shrink

13          to nothing, then indicating a solution is not possible;

14          if said shrinking and expanding create a new polygon

15          which completely covers said current polygon, then

16          terminating said iteratively shrinking and expanding

17          and returning said border width variable for use in

18          subsequent processing; and

19          if said shrinking and expanding create a polygon which

20          does not cover said current polygon, then returning

21          said minimum strip width parameter for use as said

22          border width variable in subsequent processing.

1          11. [Currently amended] The method of ~~claim 6~~ claim 2,

2          said generating orthogonal fill stripes, further comprising:

3          analyzing areas to be filled to determine optimal



4 stripe direction; and

5 iteratively generating fill stripes in said optimal  
6 stripe direction to fill said areas to be filled.

1 12. [Currently amended] The method of ~~claim 6~~ claim 2,  
2 said processing uncovered areas further comprising:

3 locating all uncovered polygon areas by subtracting the  
4 union of all existing fill shapes from said original  
5 polygon envelope; and

6 iteratively process each said uncovered polygon area,  
7 selectively bordering and orthogonally filling those  
8 uncovered polygon areas which are exterior polygons,  
9 and filling with a single rectangle uncovered polygon  
10 areas which are interior polygons.

1 13. [Original] The method of claim 8, said first factor  
2 being 3 and said second factor being 0.8.

1 14. [Currently amended] An artwork generating system,  
2 comprising:

3 an exposure tool for exposing a glass master to a  
4 polygon envelop as a plurality of polygon fill stripes;

5 a polygon fill control module defining an optimum set  
6 of said polygon fill stripes for filling said polygon  
7 envelope, said control module being operable for

8 generating a first plurality of fill stripes  
9 comprising a plurality of border polygons  
10 including:

11  
12 calculating a maximum current polygon border  
13 width parameter for a current polygon;

14 responsive to said maximum current polygon  
15 border width parameter, calculating a border  
16 width parameter for a current border;

17 creating a border polygon with a width equal  
18 to said border width parameter;

19 responsive to a merge adjacent borders flag  
20 being enabled, creating a new border  
21 including merging said current border polygon

22                   with a previous border polygon if possible;  
  
23                   responsive to said new border polygon from  
24                   said merging, creating a new fill polygon;  
  
25                   creating a least encompassing rectangle for  
26                   said new fill polygon; and  
  
27                   responsive to said least encompassing  
28                   rectangle being contained entirely within  
29                   said original polygon envelope, ending said  
30                   creating a border polygon and returning any  
31                   uncovered area within said new fill polygon;  
32                   otherwise, returning to said calculating  
33                   width to process said new fill polygon as  
34                   said current polygon;  
  
35                   generating zero to a plurality of orthogonal fill  
36                   stripes; and  
  
37                   generating zero to a plurality of fill stripes for  
38                   processing uncovered areas.

1       15.   [Currently amended]   A method for filling an original

2 polygon envelope with a minimum number of stripes,  
3 comprising:

4 generating a first plurality of stripes for creating a  
5 border polygon, including:

6  
7 calculating a maximum current polygon border width  
8 parameter for a current polygon;

9 responsive to said maximum current polygon border  
10 width parameter, calculating a border width  
11 parameter for a current border;

12 creating a border polygon with a width equal to  
13 said border width parameter;

14 responsive to a merge adjacent borders flag being  
15 enabled, creating a new border including merging  
16 said current border polygon with a previous border  
17 polygon if possible;

18 responsive to said new border polygon from said  
19 merging, creating a new fill polygon;

20                   creating a least encompassing rectangle for said  
21                   new fill polygon; and  
  
22                   responsive to said least encompassing rectangle  
23                   being contained entirely within said original  
24                   polygon envelope, ending said creating a border  
25                   polygon and returning any uncovered area within  
26                   said new fill polygon; otherwise, returning to  
27                   said calculating width to process said new fill  
28                   polygon as said current polygon;  
  
29                   generating a second plurality zero or more stripes  
30                   comprising orthogonal fill stripes; and  
  
31                   generating a third plurality of zero or more stripes  
32                   for processing uncovered areas.

1       16. [Currently amended] A system for filling an original  
2       polygon envelope with a minimum number of stripes,  
3       comprising:

4                   means for generating a first plurality of stripes for  
5                   creating a border polygon, including:  
6

7           calculating a maximum current polygon border width  
8           parameter for a current polygon;  
  
9           responsive to said maximum current polygon border  
10          width parameter, calculating a border width  
11          parameter for a current border;  
  
12          creating a border polygon with a width equal to  
13          said border width parameter;  
  
14          responsive to a merge adjacent borders flag being  
15          enabled, creating a new border including merging  
16          said current border polygon with a previous border  
17          polygon if possible;  
  
18          responsive to said new border polygon from said  
19          merging, creating a new fill polygon;  
  
20          creating a least encompassing rectangle for said  
21          new fill polygon; and  
  
22          responsive to said least encompassing rectangle  
23          being contained entirely within said original  
24          polygon envelope, ending said creating a border

25           polygon and returning any uncovered area within  
26           said new fill polygon; otherwise, returning to  
27           said calculating width to process said new fill  
28           polygon as said current polygon;

29           means for generating a second plurality of zero or more  
30           stripes comprising orthogonal fill stripes; and

31           means for generating a third plurality of zero or more  
32           stripes for processing uncovered areas.

1       17.   [Currently amended] A program storage device readable  
2       by a machine, tangibly embodying a program of instructions  
3       executable by a machine to perform a method for filling an  
4       original polygon envelope with a minimum number of stripes,  
5       said method comprising:

6           generating a first plurality of stripes for creating a  
7           border polygon, including:

8  
9           calculating a maximum current polygon border width  
10          parameter for a current polygon;  
11          responsive to said maximum current polygon border

12           width parameter, calculating a border width  
13           parameter for a current border;  
  
14           creating a border polygon with a width equal to  
15           said border width parameter;  
  
16           responsive to a merge adjacent borders flag being  
17           enabled, creating a new border including merging  
18           said current border polygon with a previous border  
19           polygon if possible;  
  
20           responsive to said new border polygon from said  
21           merging, creating a new fill polygon;  
  
22           creating a least encompassing rectangle for said  
23           new fill polygon; and  
  
24           responsive to said least encompassing rectangle  
25           being contained entirely within said original  
26           polygon envelope, ending said creating a border  
27           polygon and returning any uncovered area within  
28           said new fill polygon; otherwise, returning to  
29           said calculating width to process said new fill  
30           polygon as said current polygon;



31 generating a second plurality of zero or more stripes  
32 comprising orthogonal fill stripes; and  
  
33 generating a third plurality of zero or more stripes  
34 for processing uncovered areas.

1 18. [Currently amended] An article of manufacture  
2 comprising:

3 a computer useable medium having computer readable  
4 program code means embodied therein for filling an  
5 original polygon envelope with a minimum number of  
6 stripes, the computer readable program means in said  
7 article of manufacture comprising:

8 computer readable program code means for causing a  
9 computer to effect generating a first plurality of  
10 stripes for creating a border polygon, including:

11  
12 calculating a maximum current polygon border width  
13 parameter for a current polygon;

14 responsive to said maximum current polygon border

15           width parameter, calculating a border width  
16           parameter for a current border;

17           creating a border polygon with a width equal to  
18           said border width parameter;

19           responsive to a merge adjacent borders flag being  
20           enabled, creating a new border including merging  
21           said current border polygon with a previous border  
22           polygon if possible;

23           responsive to said new border polygon from said  
24           merging, creating a new fill polygon;

25           creating a least encompassing rectangle for said  
26           new fill polygon; and

27           responsive to said least encompassing rectangle  
28           being contained entirely within said original  
29           polygon envelope, ending said creating a border  
30           polygon and returning any uncovered area within  
31           said new fill polygon; otherwise, returning to  
32           said calculating width to process said new fill  
33           polygon as said current polygon;

34 computer readable program code means for causing a  
35 computer to effect generating a second plurality of  
36 zero or more stripes comprising orthogonal fill  
37 stripes; and

38 computer readable program code means for causing a  
39 computer to effect generating a third plurality of zero  
40 or more stripes for processing uncovered areas.

1 19. [Currently amended] A computer program product or  
2 computer program element for filling an original polygon  
3 envelope with a minimum number of stripes, according to a  
4 method comprising:

5 generating a first plurality of stripes for creating at  
6 least one border polygon, including:

7  
8 calculating a maximum current polygon border width  
9 parameter for a current polygon;

10 responsive to said maximum current polygon border  
11 width parameter, calculating a border width  
12 parameter for a current border;

13           creating a border polygon with a width equal to  
14           said border width parameter;

15           responsive to a merge adjacent borders flag being  
16           enabled, creating a new border including merging  
17           said current border polygon with a previous border  
18           polygon if possible;

19           responsive to said new border polygon from said  
20           merging, creating a new fill polygon;

21           creating a least encompassing rectangle for said  
22           new fill polygon; and

23           responsive to said least encompassing rectangle  
24           being contained entirely within said original  
25           polygon envelope, ending said creating a border  
26           polygon and returning any uncovered area within  
27           said new fill polygon; otherwise, returning to  
28           said calculating width to process said new fill  
29           polygon as said current polygon;

30           generating a second plurality of zero or more stripes  
31           comprising orthogonal fill stripes; and

32           generating a third plurality of zero or more stripes  
33           for processing uncovered areas.

1       20. [Previously presented] A program storage device  
2       readable by a machine, tangibly embodying a program of  
3       instructions executable by a machine to perform a method for  
4       filling an original polygon envelope with a minimum number  
5       of stripes, said method comprising:

6           receiving input parameters, said input parameters  
7           including parameters defining a minimum stripe width, a  
8           maximum stripe width, and a merge adjacent borders  
9           flag;

10          first generating a first plurality of stripes for  
11          creating at least one border polygon;

12          second generating a second plurality of zero or more  
13          stripes comprising orthogonal fill stripes; and

14          third generating a third plurality of zero or more  
15          stripes for processing uncovered areas;

16          said first generating including:

17           calculating a maximum current polygon border width  
18           parameter for a current polygon;  
  
19           responsive to said maximum current polygon border  
20           width parameter, calculating a border width  
21           parameter for a current border;  
  
22           creating a border polygon with a width equal to  
23           said border width parameter;  
  
24           responsive to said merge adjacent borders flag  
25           being enabled, creating a new border including  
26           merging said current border with a previous border  
27           if possible;  
  
28           responsive to said new border from said merging,  
29           creating a new fill polygon;  
  
30           creating a least encompassing rectangle for said  
31           new fill polygon; and  
  
32           responsive to said least encompassing rectangle  
33           being contained entirely within said original  
34           polygon envelope, ending said creating a border

35 polygon and passing any uncovered area within said  
36 new fill polygon to said generating a second  
37 plurality of zero or more stripes comprising  
38 orthogonal fill stripes; otherwise, returning to  
39 said calculating width to process said new fill  
40 polygon as said current polygon.

1 21. [Currently amended] A method for filling an original  
2 polygon envelope with a minimum number of stripes  
3 comprising:

4 receiving means for receiving input parameters, said  
5 input parameters including parameters defining a  
6 minimum stripe width, a maximum stripe width, and a  
7 merge adjacent borders flag;

8 first generating means for generating a first plurality  
9 of stripes for creating at least one border polygon,  
10 including:

11  
12 calculating a maximum current polygon border width  
13 parameter for a current polygon;

14 responsive to said maximum current polygon border

15           width parameter, calculating a border width  
16           parameter for a current border;

17           creating a border polygon with a width equal to  
18           said border width parameter;

19           responsive to a merge adjacent borders flag being  
20           enabled, creating a new border including merging  
21           said current border polygon with a previous border  
22           polygon if possible;

23           responsive to said new border polygon from said  
24           merging, creating a new fill polygon;

25           creating a least encompassing rectangle for said  
26           new fill polygon; and

27           responsive to said least encompassing rectangle  
28           being contained entirely within said original  
29           polygon envelope, ending said creating a border  
30           polygon and returning any uncovered area within  
31           said new fill polygon; otherwise, returning to  
32           said calculating width to process said new fill  
33           polygon as said current polygon;



34 second generating means for generating a second  
35 plurality of zero or more stripes comprising orthogonal  
36 fill stripes; and

37 third generating means for generating a third plurality  
38 of zero or more stripes for processing uncovered areas;

1 22. [Previously presented] A method for filling an  
2 original polygon envelope with a minimum number of stripes,  
3 comprising of:

4 creating a border polygon;

5 generating orthogonal fill stripes;

6 processing uncovered areas;

7 receiving input parameters, said input parameters  
8 including parameters defining a minimum stripe width, a  
9 maximum stripe width, and a merge adjacent borders  
10 flag;

11 said creating a border polygon further comprising:

12           calculating a maximum current polygon border width  
13           parameter for a current polygon;  
  
14           responsive to said maximum current polygon border  
15           width parameter, calculating a border width  
16           parameter for a current border;  
  
17           creating a border polygon with a width equal to  
18           said border width parameter;  
  
19           responsive to said merge adjacent borders flag  
20           being enabled, creating a new border including  
21           merging said current border with a previous border  
22           if possible;  
  
23           responsive to said new border from said merging,  
24           creating a new fill polygon;  
  
25           creating a least encompassing rectangle for said  
26           new fill polygon;  
  
27           responsive to said least encompassing rectangle  
28           being contained entirely within said original  
29           polygon envelope, ending said creating a border

30 polygon and passing any uncovered area within said  
31 new fill polygon to said generating; otherwise,  
32 returning to said calculating width to process  
33 said new fill polygon as said current polygon;

34 said calculating a maximum current polygon border width  
35 including adjusting said maximum stripe width input  
36 parameter to a new upper limit which reflects  
37 characteristics of said current polygon as well as any  
38 previous border polygons by

39 calculating the length of each side of said  
40 current polygon;

41 deriving a smallest side length parameter equal to  
42 the larger of (1) a first factor times said  
43 minimum stripe width or (2) the length of the  
44 shortest side obtained from said calculating  
45 length;

46 setting said smallest side length parameter from  
47 said deriving to a reduced amount by a second  
48 factor;

49           if said current polygon is an inner border and  
50           said smallest side length parameter is less than  
51           the previous border width, setting said smallest  
52           side length equal to said previous border width;  
  
53           if said smallest side length parameter is greater  
54           than said maximum stripe width parameter, setting  
55           said smallest side length parameter equal to said  
56           maximum strip width parameter; and  
  
57           returning said smallest side length parameter for  
58           processing as said maximum current polygon border  
59           width parameter.

1       23. [Previously presented] The method of claim 22, said  
2       calculating a border width for a current border further  
3       comprising:

4           responsive to said minimum stripe width parameter and  
5           said maximum current polygon border width parameter,  
6           deriving a border width variable selectively operable  
7           for determining that said current polygon is impossible  
8           to be bordered or that said generating orthogonal fill  
9           stripe be executed.

1       24. [Previously presented] The method of claim 23, said  
2       deriving a border width variable further comprising:

3           initializing said border width variable equal to said  
4           maximum current polygon border width parameter;

5           rounding said border width variable;

6           if said border width variable exceeds said maximum  
7           stripe width parameter, setting said border width  
8           variable equal to said maximum stripe width parameter;

9           iteratively shrinking and expanding said current  
10          polygon with a shrink value equal to said border width  
11          variable;

12          if said shrinking causes said current polygon to shrink  
13          to nothing, then indicating a solution is not possible;

14          if said shrinking and said expanding create a new  
15          polygon which completely covers said current polygon,  
16          then terminating said iteratively shrinking and  
17          expanding and returning said border width variable for

18           use in subsequent processing; and

19           if said shrinking and expanding create a polygon which  
20           does not cover said current polygon, then returning  
21           said minimum strip width parameter for use as said  
22           border width variable in subsequent processing.

1       25. [Previously presented] The method of claim 22, said  
2       first factor being 3 and said second factor being 0.8.

1       26. [Previously presented] A method for filling an  
2       original polygon envelope with a minimum number of stripes,  
3       comprising:

4           creating a border polygon;

5           generating orthogonal fill stripes;

6           processing uncovered areas;

7           receiving input parameters, said input parameters  
8           including parameters defining a minimum stripe width, a  
9           maximum stripe width, and a merge adjacent borders  
10          flag; and

11           said creating a border polygon further comprising:

12                 calculating a maximum current polygon border width

13                 parameter for a current polygon;

14                 responsive to said maximum current polygon border

15                 width parameter, calculating a border width

16                 parameter for a current border;

17                 creating a border polygon with a width equal to

18                 said border width parameter;

19                 responsive to said merge adjacent borders flag

20                 being enabled, creating a new border including

21                 merging said current border with a previous border

22                 if possible;

23                 responsive to said new border from said merging,

24                 creating a new fill polygon;

25                 creating a least encompassing rectangle for said

26                 new fill polygon; and

27                 responsive to said least encompassing rectangle

28           being contained entirely within said original  
29           polygon envelope, ending said creating a border  
30           polygon and passing any uncovered area within said  
31           new fill polygon to said generating; otherwise,  
32           returning to said calculating width to process  
33           said new fill polygon as said current polygon.

34       27. [Previously presented]   The method of claim 26, said  
35       calculating a maximum current polygon border width further  
36       comprising:

37           adjusting said maximum stripe width input parameter to  
38           a new upper limit which reflects characteristics of  
39           said current polygon as well as any previous border  
40           polygons.

1       28. [Previously presented]   The method of claim 26, said  
2       generating orthogonal fill stripes, further comprising:

3           analyzing areas to be filled to determine optimal  
4           stripe direction; and

5           iteratively generating fill stripes in said optimal  
6           stripe direction to fill said areas to be filled.



1       29. [Previously presented] The method of claim 26, said  
2       processing uncovered areas further comprising:

3             locating all uncovered polygon areas by subtracting the  
4             union of all existing fill shapes from said original  
5             polygon envelope; and

6             iteratively process each said uncovered polygon area,  
7             selectively bordering and orthogonally filling those  
8             uncovered polygon areas which are exterior polygons,  
9             and filling with a single rectangle uncovered polygon  
10            areas which are interior polygons.

1       30. [Previously presented] The method of claim 22, said  
2       first factor being 3 and said second factor being 0.8.